

What is claimed is:

1. An apparatus for reproducing information from an optical information storage medium which comprises a lead-in area, a user data area, and a lead-out area, whereon optical information storage medium-related information is recorded in at least a portion of the lead-in area and reproduction-related user data are recorded in a remaining area of the optical information storage medium, the apparatus comprising:

a light source which radiates a laser light beam;

an objective lens which condenses the laser light beam to be focused on the optical information storage medium;

a photodetector which receives the laser light beam reflected from the optical information storage medium and which comprises first and second photodiodes which independently convert a received optical signal into first and second electric signals, respectively;

a reproduction-related user (RRU) data demodulator which demodulates the reproduction-related user data from a sum signal of the first and second electrical signals; and

a read only memory-permanent information control (ROM-PIC) data demodulator which demodulates the optical information storage medium-related information from the sum signal.

2. The optical information reproducing apparatus of claim 1, wherein:

the RRU data demodulator reproduces the reproduction-related user data which is recorded on the optical information storage medium according to a run length-limited (RLL) modulation method, and

the ROM-PIC data demodulator reproduces the optical information storage medium-related information which is recorded on the optical information storage medium according to a bi-phase modulation method.

3. The optical information reproducing apparatus of claim 2, wherein the RLL modulation method is an RLL (1, 7) modulation method.

4. The optical information reproducing apparatus of claim 2, wherein the RLL modulation method is an RLL (2, 10) modulation method.

5. The optical information reproducing apparatus of claim 4, wherein the optical information storage medium-related information is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

6. The optical information reproducing apparatus of claim 5, further comprising a modulation code detector which detects from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes by detecting the mark and the space having the length of  $nT$ , and the mark and the space having the length of  $2nT$ .

7. The optical information reproducing apparatus of claim 3, wherein the optical information storage medium-related information is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

8. The optical information reproducing apparatus of claim 7, further comprising a modulation code detector which detects from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes by detecting the mark and the space having the length of  $nT$ , and the mark and the space having the length of  $2nT$  recorded according to the bi-phase modulation method.

9. The optical information reproducing apparatus of claim 2, further comprising a modulation code detector which detects from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes by detecting the mark and the space having a length of  $nT$ , and the mark and the space having a length of  $2nT$  recorded according to the bi-phase modulation method.

10. The optical information reproducing apparatus of claim 1, further comprising a modulation code detector which detects from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes.

11. An apparatus for reproducing information from an optical information storage medium (OISM), wherein the OISM is one of a read-only OISM and a recordable OISM, the OISM comprising a lead-in area, a user data area, and a lead-out area and optical

information storage medium-related information (OISMRI) is recorded as one of read-only OISMRI and recordable OISMRI in at least a portion of the lead-in area and reproduction-related user (RRU) data is recorded in a remaining area of the OISM, and where the OISM is the recordable OISM, the OISMRI is recorded as pit wobbles, the apparatus comprising:

- a light source which radiates a laser light beam;
- an objective lens which condenses the laser light beam to be focused on the one of the read-only OISM and the recordable OISM;
- a photodetector which receives an optical signal reflected from the one of the read-only OISM and the recordable OISM and comprises first and second photodiodes which convert the received optical signal into independent electric signals;
- a reproduction-related user (RRU) data demodulator which demodulates the RRU data from a sum signal of the electric signals; and
- a read only memory-permanent information and control (ROM-PIC) data demodulator which demodulates the read-only OISMRI from the sum signal;
- a wobble PIC demodulator which demodulates the recordable OISMRI which is recorded as pit wobbles, from a differential signal of the electrical signals; and
- a wobble physical identification data (PID) demodulator which demodulates physical identification data which are recorded as pit wobbles on the recordable OISM, from the differential signal,

wherein:

where the OISM is the read-only OISM, the optical information reproducing apparatus reproduces information from the read-only OISM using signals obtained from the RRU data demodulator and the ROM-PIC data demodulator, and

where the OISM is the recordable OISM, the optical information reproducing apparatus reproduces information from the recordable OISM using signals obtained from the RRU data demodulator, the wobble PIC demodulator, and the wobble PID demodulator.

12. The optical information reproducing apparatus of claim 11, wherein the RRU data demodulator reproduces the reproduction-related user data which are recorded on the optical information storage medium according to a run length-limited (RLL) modulation method, and the ROM-PIC data demodulator reproduces the OISMRI which is recorded on the OISM according to a bi-phase modulation method.

13. The optical information reproducing apparatus of claim 12, wherein the RLL modulation method is an RLL (1, 7) modulation method.

14. The optical information reproducing apparatus of claim 13, wherein the OISMRI is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

15. The optical information reproducing apparatus of claim 12, wherein the RLL modulation method is an RLL (2, 10) modulation method.

16. The optical information reproducing apparatus of claim 15, wherein the OISMRI is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

17. The optical information reproducing apparatus of claim 12, wherein the OISMRI is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

18. The optical information reproducing apparatus of claim 17, further comprising a modulation code detector which detects from the sum signal whether the OISM comprises a plurality of different modulation codes by detecting the mark and the space having the length of  $nT$ , and the mark and the space having the length of  $2nT$ .

19. The optical information reproducing apparatus of claim 16, further comprising a modulation code detector which detects from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes.

20. A method of reproducing information from an optical information storage medium which comprises a lead-in area, a user data area, and a lead-out area, wherein optical information storage medium-related information is recorded in the entire lead-in area or a portion of the lead-in area and reproduction-related user data are recorded in a remaining area of the optical information storage medium, the optical information reproducing method comprising:

- radiating a laser light beam onto the optical information storage medium;
- converting respective portions of an optical signal reflected from the optical information storage medium into independent electric signals;
- demodulating the reproduction-related user data from a sum signal of electrical signals; and

demodulating the optical information storage medium-related information from the sum signal.

21. The method of claim 20, where the reproduction-related user data recorded according to an RLL modulation method on the optical information storage medium is reproduced in the demodulation of the reproduction-related user data, and the optical information storage medium-related information recorded on the optical information storage medium according to a bi-phase modulation method is reproduced in the demodulation of the optical information storage medium-related information.

22. The method of claim 21, wherein the RLL modulation method is an RLL (1, 7) modulation method.

23. The method of claim 22, wherein the optical information storage medium-related information is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

24. The method of claim 21, wherein the RLL modulation method is an RLL (2, 10) modulation method.

25. The method of claim 24, wherein the optical information storage medium-related information is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

26. The method of claim 20, further comprising a modulation code detector which detects from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes by detecting a mark and a space having a length of  $nT$ ; and a mark and the space having a length of  $2nT$  recorded according to a bi-phase modulation method.

27. The method of claim 20, further comprising a modulation code detector which detects from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes.

28. A method of reproducing information from an optical information storage medium (OISM), wherein the OISM is one of a read-only OISM and a recordable OISM, the OISM comprising a lead-in area, a user data area, and a lead-out area and optical information storage medium-related information (OISMRI) is recorded as one of read-only OISMRI and recordable OISMRI in at least a portion of the lead-in area and reproduction-related user (RRU) data is recorded in a remaining area of the OISM, and where the OISM is the recordable OISM, the OISMRI is recorded as pit wobbles, the method comprising:

radiating a laser light beam onto the one of the read-only OISM and the recordable OISM;

converting respective portions of the laser light beam reflected from the OISM into independent electric signals;

determining whether the read-only OISM or the recordable OISM is used based on whether a differential signal of the electrical signals comprises a wobbling signal;

demodulating the RRU data from a sum signal of the electrical signals;

demodulating the read-only OISMRI from the sum signal when the read-only OISM is used; and

where the recordable OISM is used, demodulating both the recordable OISMRI which is recorded as pit wobbles and physical identification data which are recorded as pit wobbles from the differential signal.

29. The method of claim 28, wherein the RRU data recorded according to an RLL modulation method on the OISM is reproduced in the demodulation of the RRU data, and the OISMRI recorded on the optical information storage medium according to a bi-phase modulation method is reproduced in the demodulation of the OISMRI.

30. The method of claim 29, wherein the RLL modulation method is an RLL (1, 7) modulation method.

31. The method of claim 30, wherein the OISMRI is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

32. The method of claim 29, wherein the RLL modulation method is an RLL (2, 10) modulation method.

33. The method of claim 32, wherein information is recorded as a mark and a space having a length of  $nT$ , and a mark and a space having a length of  $2nT$ , where  $n$  is an integer in a range where  $2 \leq n \leq 8$ .

34. The method of claim 28, further comprising detecting from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes by detecting the mark and the space having a length of  $nT$ , and the mark and the space having a length of  $2nT$ .

35. The method of claim 28, further comprising detecting from the sum signal whether the optical information storage medium comprises a plurality of different modulation codes.

36. An apparatus for reproducing information, the apparatus comprising:  
an optical information storage medium (OISM), the OISM comprising a lead-in area, a user data area, and a lead-out area wherein optical information storage medium-related information (OISMRI) is recorded in at least a portion of the lead-in area as pit wobbles and reproduction-related user (RRU) data is recorded in a remaining area of the OISM;  
an optical system which converts an optical signal reflected from the OISM into first and second independent signals;  
a reproduction-related user (RRU) data demodulator which demodulates the RRU data from a sum signal of the first and second independent signals;  
a read only memory-permanent information and control (ROM-PIC) data demodulator which demodulates the OISMRI from the sum signal;  
a wobble PIC demodulator which demodulates the OISMRI from a differential signal of the first and second independent signals;  
a wobble physical identification data (PID) demodulator which demodulates physical identification data which are recorded as pit wobbles; and  
a signal processor which outputs a reproduction signal in response to an output of the RRU data demodulator and selected ones of the ROM-PIC data demodulator, the wobble PIC demodulator and the wobble PID demodulator.

37. The apparatus of claim 36, further comprising:

a first switch which selectively connects the ROM-PIC demodulator and the wobble PIC demodulator to the signal processor; and

a second switch which selectively connects the wobble PID demodulator to the signal processor, wherein:

during reproduction from a read-only OISM, the first switch connects the ROM-PIC demodulator to the signal processor, and the second switch makes no connection, and

during reproduction from a recordable optical information storage medium, the first switch connects the wobble PID demodulator to the signal processor and the second switch connects the wobble PID demodulator.

38. The apparatus of claim 37, further comprising:

a modulation code detector which determines whether the sum signal comprises a plurality of different modulation codes, wherein:

the connections of the first and second switches are determined in response to the determination of the plurality of modulation codes.